

Summary: There is a lot of confusion over the terms permethrin, pyrethrum, and pyrethroid. This article examines the important differences between these similar-sounding pesticides.

Permethrin & Pyrethrum Insecticides

One is a natural insecticide the other is synthetic

Pyrethrum, natural pyrethrum or "insect powder"

Pyrethrum is a natural insecticide made from the flowers of certain species of chrysanthemum. It is a mixture of several different compounds called **pyrethrins** and **cinerins**. Originally pyrethrum was made by grinding dried chrysanthemum flowers into a powder.

Today, pyrethrum is extracted from chrysanthemum plant material with solvents. Pyrethrum is still widely used today in household insect sprays where it is usually combined with another chemical "synergist" called **piperonyl butoxide** (PBO). PBO helps pyrethrum by enhancing its toxicity in insects.



Certain types of **chrysanthemum** flowers are the source of natural pyrethrum.

History of pyrethrum

About 200 years ago someone living in central Asia discovered that dried, crushed flowers of certain chrysanthemums were toxic to insects. During the Napoleonic Wars (1804-1815) this "**insect powder**" was used to control flea and body lice infestations by French soldiers. Since then, pyrethrum has been used in many forms for effective, low toxicity insect control. However, because natural pyrethrum is not stable in sunlight it is not used in commercial agriculture.

Pyrethroid insecticides

The term **pyrethroid** refers to a class of **synthetic insecticides** whose chemical structure is similar to natural pyrethrum. Pyrethroid insecticides were developed to match or exceed the effectiveness of natural pyrethrum but be more stable in sunlight. Whereas natural pyrethrum breaks down in as little as 12 hours, pyrethroids are long-lasting, sometimes remaining effective for more than 30 days.

Permethrin, cypermethrin, bifenthrin, and deltamethrin, are examples of **pyrethroid insecticides**. Many pyrethroid insecticides are used in agriculture because of their stability in sunlight. Pyrethroids often are called "synthetic pyrethroids" but since pyrethroid insecticides are all man-made the addition of the modifying term "synthetic" is not really needed

Using natural pyrethrum in home gardens

Pyrethrum, either alone or in combination with other compounds, is a very **effective, safe and environmentally friendly** garden insecticide. Pyrethrum-based insecticides is very effective against a wide array of garden and greenhouse pests and can often be used right up to the day of harvest.

Pyrethrum is a botanical insecticide and can be combined with neem oil or insecticidal soap for a wider spectrum of control. These combination products can be used for aphids, scale insects, spider mites, thrips and many other leaf-feeding garden pests.

Does pyrethrum = pyrethroid?

No. Pyrethrum is a relatively low toxicity natural insecticide and, since it breaks down quickly, generally has low environmental impact as well. For these reasons it enjoys a reputation of being "safe". **Pyrethroid insecticides**, on the other hand, are generally more toxic and more environmentally persistent -- i.e. not as "safe". Unfortunately, some marketers continue to claim that pyrethroid insecticides are "made from chrysanthemum flowers" implying that they are "natural and safe". These claims are false, and if done intentionally unethical.

Permethrin (a pyrethroid insecticide)

Permethrin is an older, early generation, **pyrethroid insecticide**. It is widely used and has recently enjoyed an upswing in homeowner popularity since diazinon was taken off the US market. Permethrin has many uses from landscape pest control to head lice shampoos, flea, tick and mosquito control on dogs, and mosquito control on **outdoor clothing and camping gear** (click product description right). Permethrin is relatively low toxicity (*permethrin is, however, **highly toxic to cats***) but like any insecticide should be used sparingly and with care.